

*An Extract of Mr. John Temple's Letter of March 30. 1672. to Dr. Walter Needham concerning the Structure of the Lungs.*

— IN Answer to the request of an Ingenious Dr. of Physick I was lately engaged to give my thoughts of the Structure of the Lungs; which was as follows.

I have formerly fancied, the Lungs to be composed of a multitude of vesicles: Into which opinion I was persuaded by inflation into the *Aspera arteria* of Fowls; and observing the continuation of many vesicles extended from the *bronchie* thorough the *abdomen* to the *anus*, (which I conceive to be the cause of the constant motion of the *anus* in fowls; the Air having ingress and egress there; and also that to be the reason why the *anus*'s of fowls are in malignant distempers applied to draw the infection out of the body \*:) I thence conjectured, the substance of the Lungs to be a Complication of a multitude of vesicles with the sanguineous vessels. And in this opinion I thought myself confirmed by blowing into the *Aspera arteria* of Quadrupeds; when I had cut off part of the exterior membrane of one lobe of the Lungs, and found the Lungs to rise with unequal protuberances not unlike bladders.

\* Those *anus*'s being like Cups or Ventouses, and the fowl having often stuck by its *anus* till it died; in which case the Author of this Letter affirms to have known seven chickens applied to the groin of one visited by the plague, that stuck till they died, and the eight went quickly off, and lived above  $1\frac{1}{2}$  year after.

But this second contrivance, which I am going to describe to you, hath much shaken that conjecture.

March 2. 1672, I made a ligature about a Dogs neck, and opening both the Jugular veins with a pretty large orifice, I let him bleed to death, (using this way to prevent being overcharged either with any quantity of blood or with blood coagulated; both which would have been hazarded, in case I had either strangled the dog, or cut one or both of the Jugulars asunder:) Immediately I open'd the *thorax*, and tying the *vena cava*, with all the passages from the left ventricle of the Heart, or its *auricula*, I cut the Lungs with the Heart and *Aspera arteria* entirely out. To the *Aspera arteria* I fitted a *siphon*, long seven inches; which I thrust two inches in length into

into the said artery, and fastned it with a strong binding of pack-thread. This done, I blew up the Lungs, and fitting a cork to the end of the syphon, I hung them in a chimney to dry. In a quarter of an hour they subsided about a sixth part; whereupon I order'd a person to watch them, and to blow them up as oft as they subsided. Which course continued, they would not the next morning subside a fourth part in three hours. And (excepting three quarters of an inch distance from the circumference of the lobes, where the thinness of the substance of the Lungs gave the external heat the advantage of a sudden passage, and quick dispatch of drying those parts least furnish'd with moisture,) I did not perceive, making a proportionable allowance for the drying of the whole substance of the Lungs, any considerable subsiding in two days more. But upon the blowing in at the syphon (whose ligature I was now forced to renew,) I could easily feel the Air to pass through the external membranes, both on the convex and concave sides, towards the extremity of the circumference of the lobes; but most abundantly on the concave side.

*March 5th,* I carefully cut off one of the lobes, and the inward structure seemed like a cane or dried flag when transversely cut; and, upon blowing in at the syphon, I fancied the Air to come equally out at all the pores I had exposed to view. Whereupon I fixed spittle in several places, and upon fresh blowing found multitudes of bubbles, made in the denudated parts of the lobe. Immediately I made a deep transverse incision into that lobe, and blowing in at the syphon, I found the Air to come so freely out at the larger ramifications of the *bronchiæ*, that I could not give the lobe a considerable rise with a strong blast: Yet upon stopping with my fingers the larger passages of the *bronchiæ*, which I had cut, I found that lobe, upon a fresh blast, considerably to arise with unequal protuberances (where the incision was made,) giving no small suspicion of some latent vesicles. Hereupon I tyed that lobe above the incision, and taking off part of the external membrane of another lobe, (having first tyed up all the rest of the lobes,) I poured water into the syphon, and applied a strong blast, in hopes to have the water come forth in streams at all  
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the pores; but that did not satisfactorily succeed, it coming out in a confused irroration of the external surface, without any ebullition, unless at the larger ramification of the *bronchiæ*. Then I tyed up this second lobe, and untied a third, powring in an ounce of the oyl of turpentine; at the syphon I gave a small blast, and corked it up. Two hours after I took off the small membrane of that lobe, and upon a gentle blast at the syphon found an ebullition of infinite little bubbles.

*March 10th* (having continued it to the chimney,) I cut all the lobes in pieces by different and various irregular incisions; whence I could easily observe the several ramifications of the aerial and sanguineous vessels, with their continuation to the circumference of the lobes, and a proportionable diminution as they were at a further distance from their original.

Shall I hence conclude the Structure of the Lungs to be a Complication of a multitude of the Ramifications of the bronchiæ and sanguineous vessels? And that the seeming vesicles were occasion'd only by the violence of the blast, and the driness of the extreme and smallest passages of the Aerial vessels; whereupon those, nearest to the *bronchiæ* (being moister,) were, more than their ordinary proportion, extended, upon hindrance of a free and usual passage to the Air in the lesser vessels or their extremities?

These cases I leave, with the manner of the Air's being commixt with the blood in the Lungs (which I think no hard matter plainly to discover,) to the *Virtuosi* of our Age, who have infinitely more advantages for the discovery of Nature's works, and to whom I cannot imagine this scribble to be any novelty. In which uncertainty I leave it to your discretion to do with it as you please.